

Fig. 1  
PRIOR ART

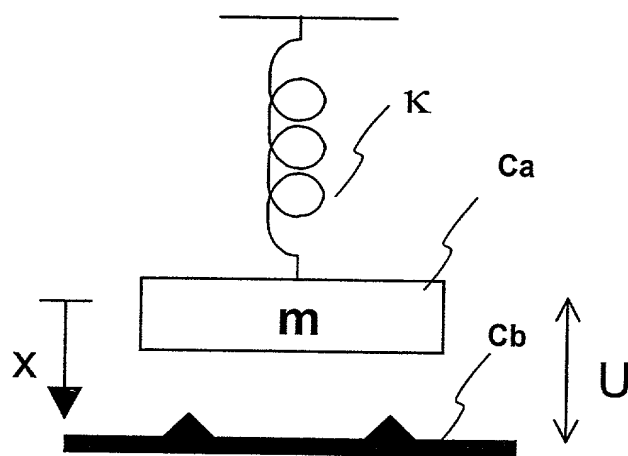
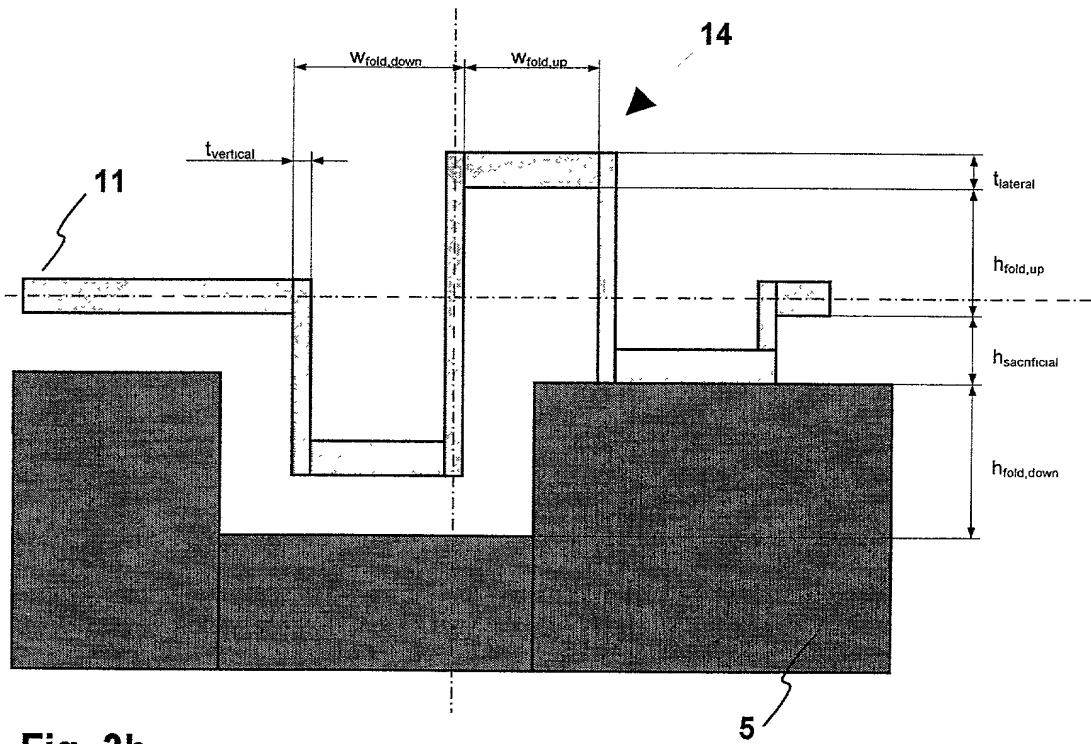
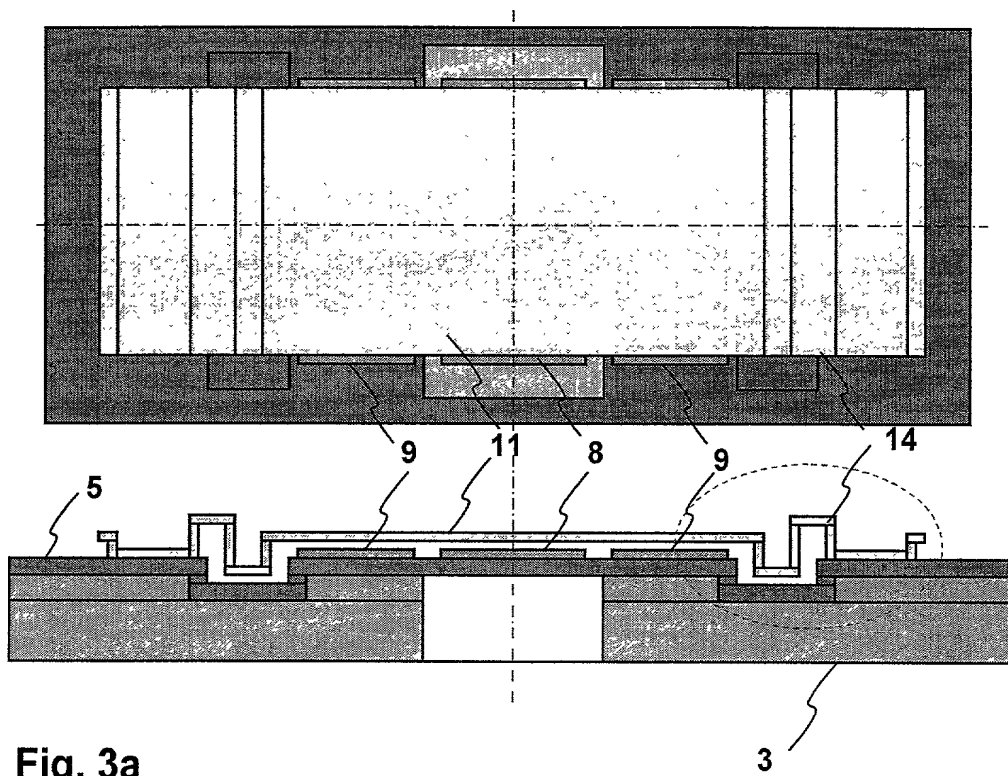


Fig. 2  
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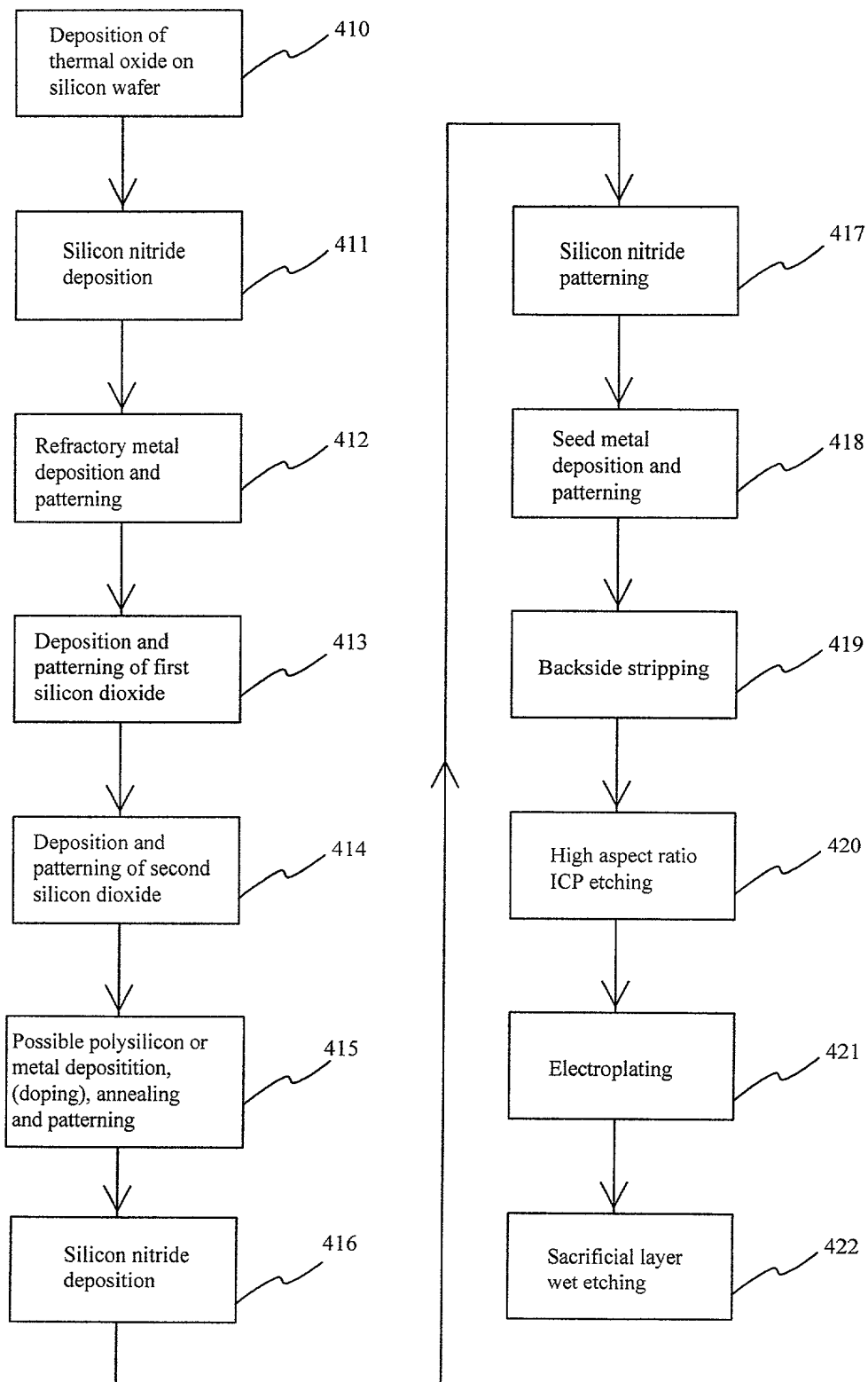
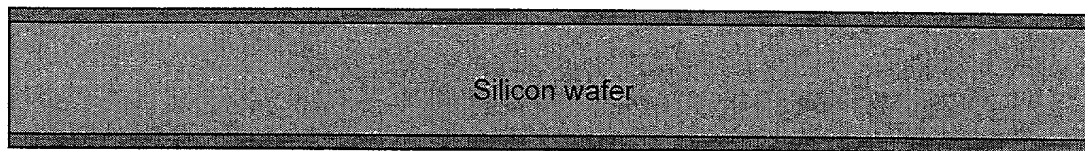
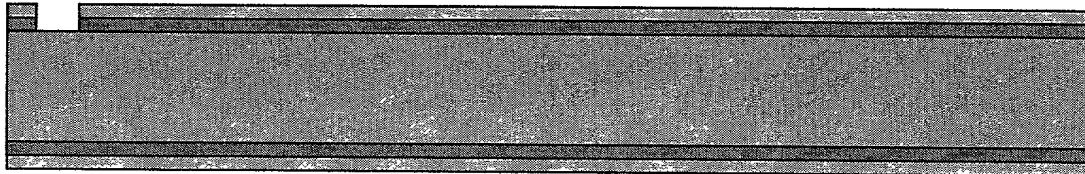


FIG. 4a

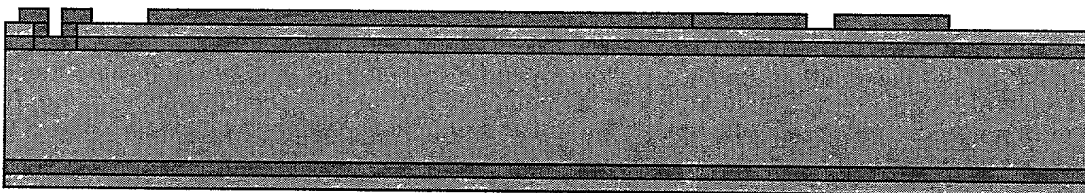
410 Thermal oxide ( $\sim 1\mu\text{m}$ )



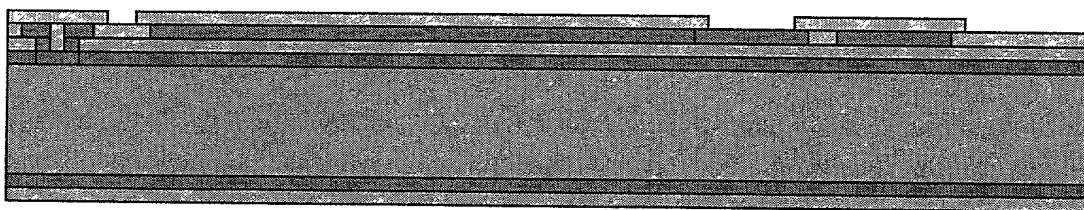
411 Silicon nitride deposition ( $\sim 1\mu\text{m}$ ) and patterning



412 Refractory metal (molybdeen or tungsten) deposition and patterning



413 First silicon dioxide deposition and patterning (plasma) ( $0.4 - 0.5\mu\text{m}$ )



414 Second silicon dioxide deposition and patterning (plasma) ( $0.5\mu\text{m}$ )

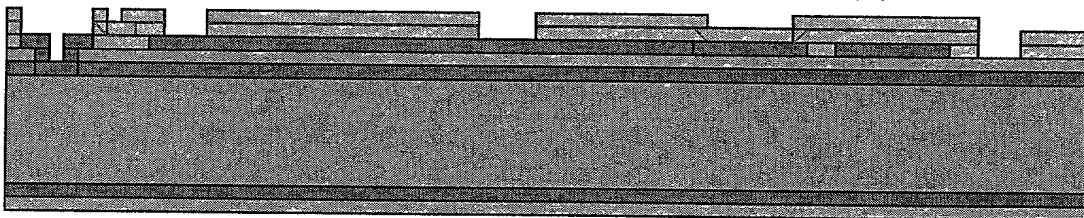
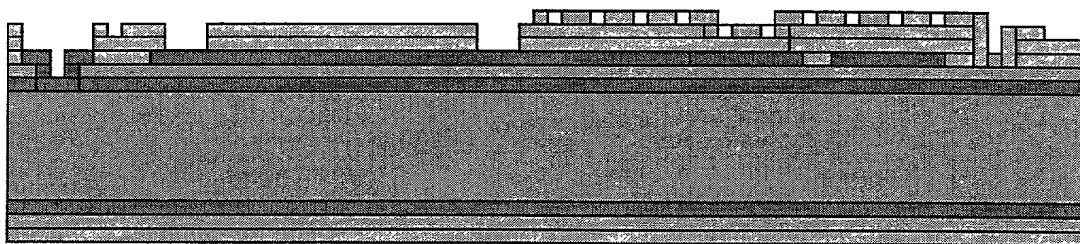
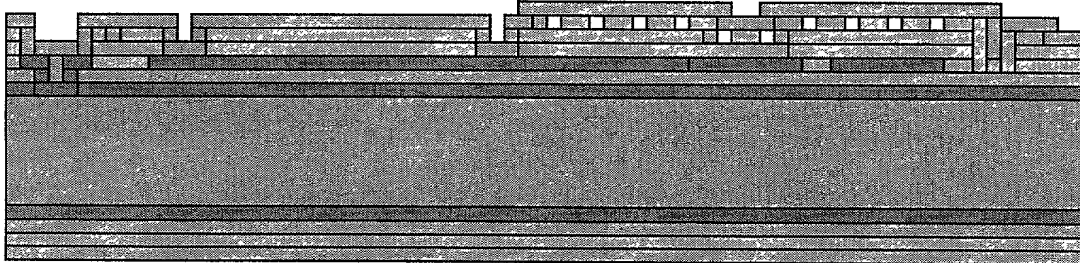


FIG. 4b

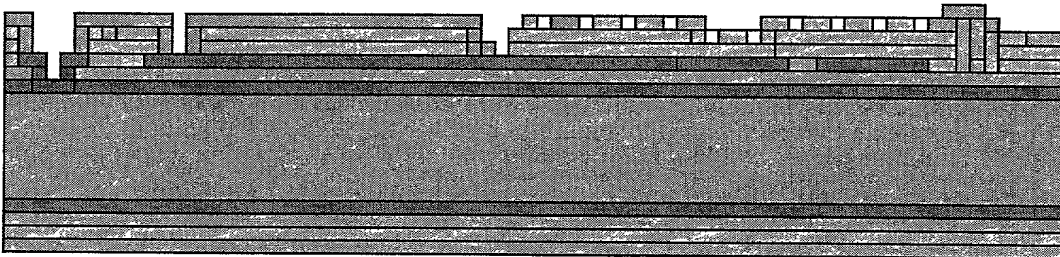
415 Polysilicon deposition (2-5  $\mu\text{m}$ ), doping, annealing and patterning;  
(PolySi:  $< 5 \Omega/\square$ ; tensile residual stress: 10 MPa)



416 Silicon nitride deposition (0.3  $\mu\text{m}$ )



417 Silicon nitride patterning (plasma)



418 Seed metal deposition and patterning

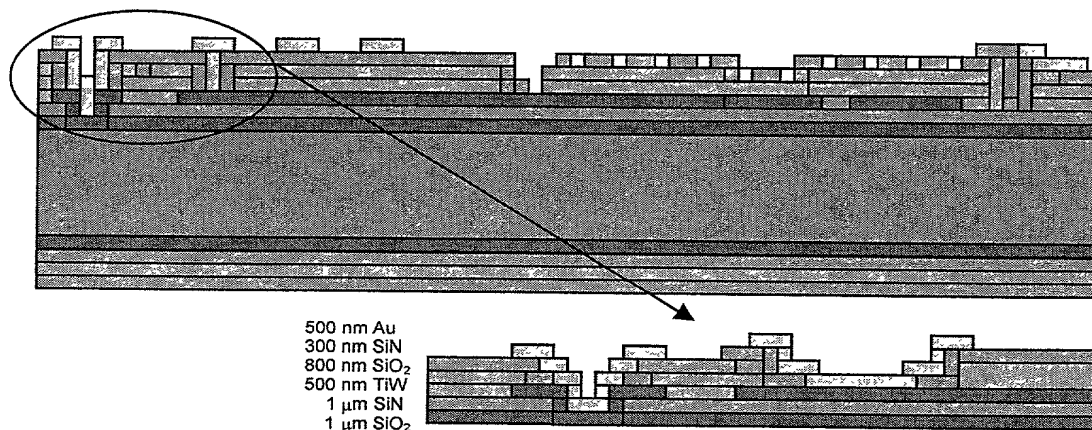
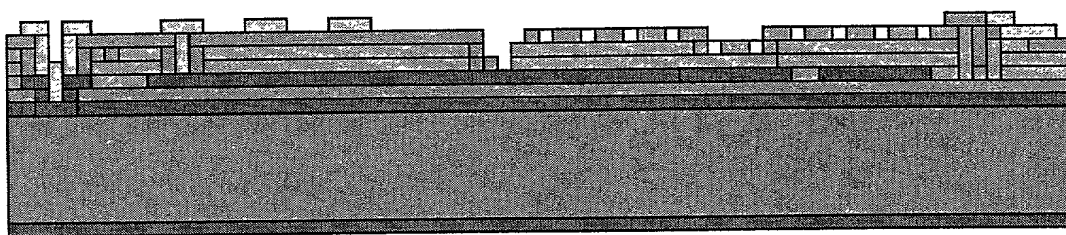
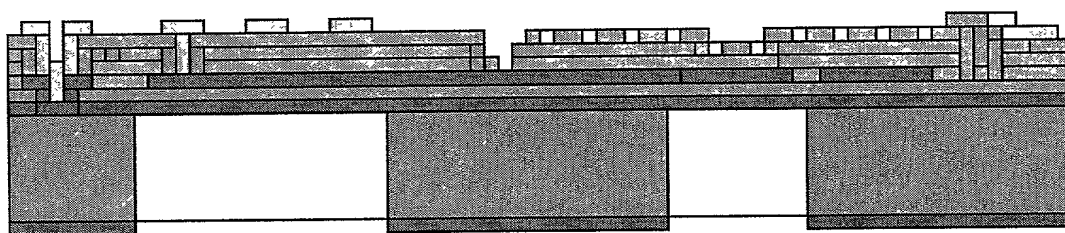


FIG. 4c

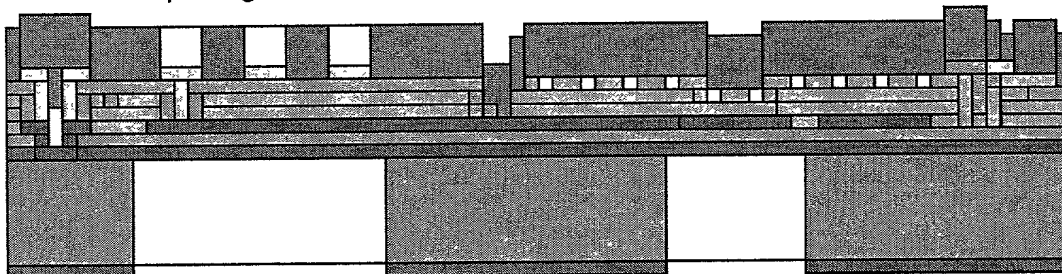
419 Backside stripping (plasma)



420 High aspect ratio ICP etching



421 Electroplating



422 Sacrificial layer wet etching (HF)

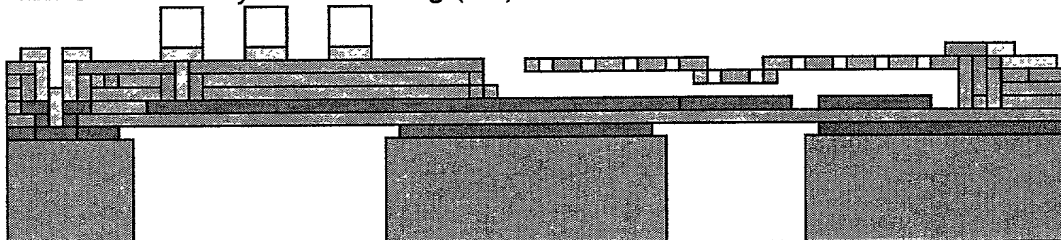


FIG. 4d



500

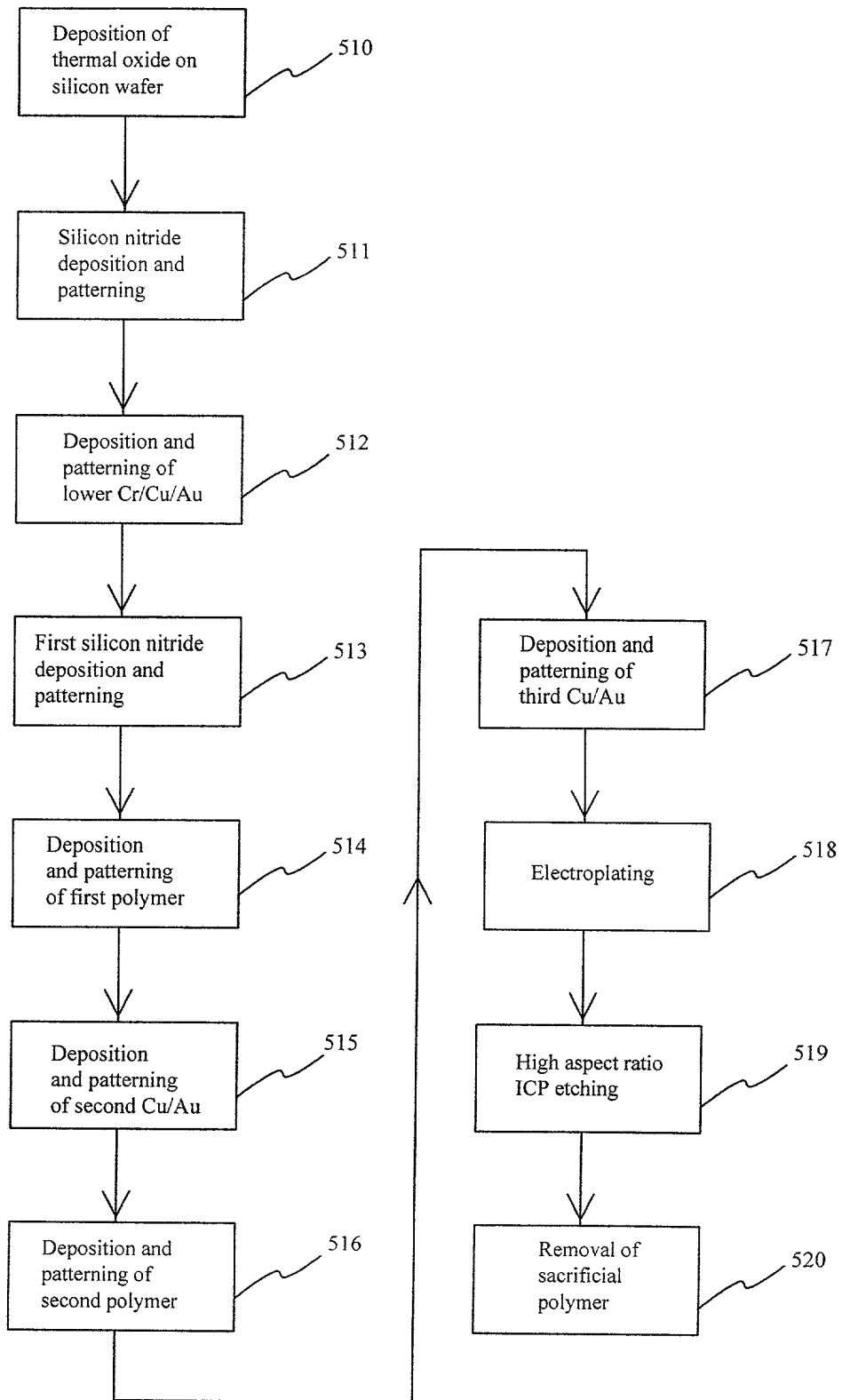
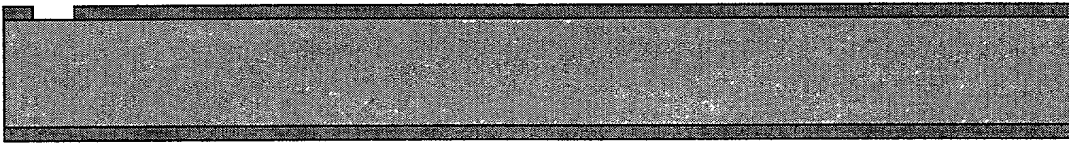
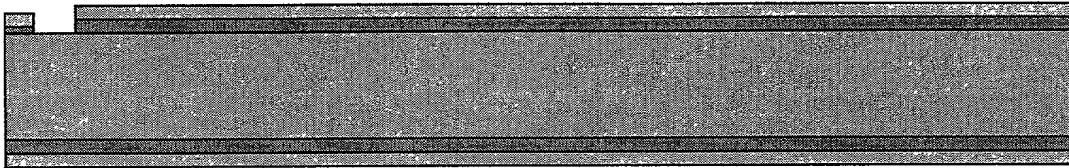


FIG. 5a

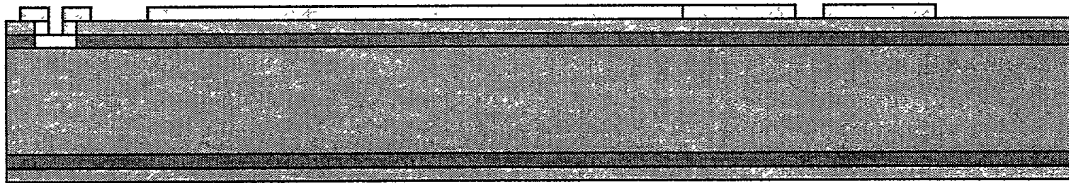
510. Thermal oxide ( $\sim 1\mu\text{m}$ )



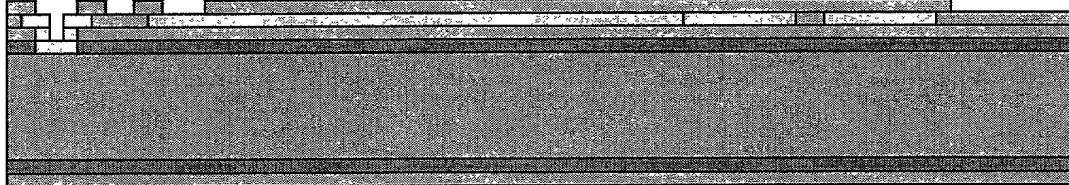
511 Silicon nitride deposition ( $\sim 1\mu\text{m}$ ) and patterning



512 Lower Cr/Cu/Au deposition and patterning



513 Silicon nitride deposition ( $0.2 - 0.3\mu\text{m}$ ) and patterning



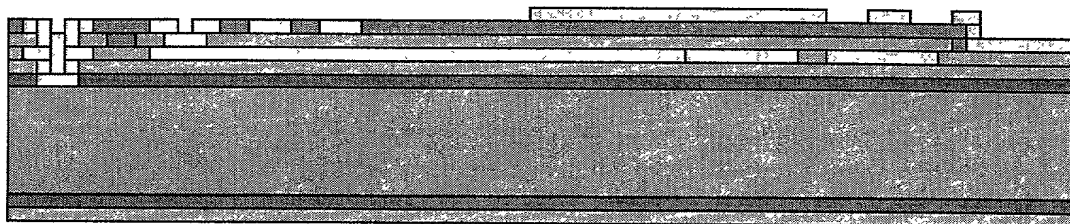
514 First polymer deposition and patterning



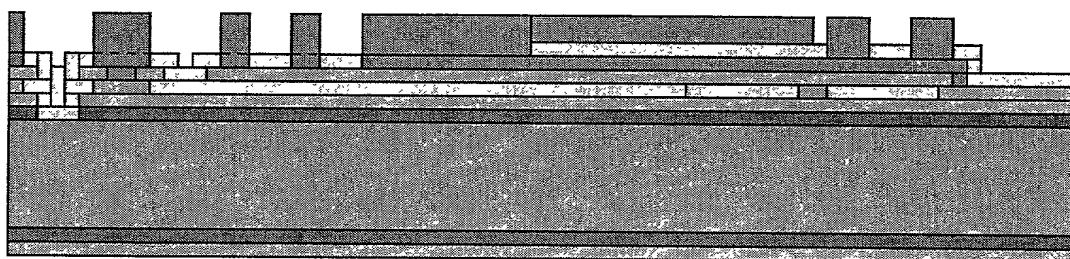
FIG. 5b



515 Second Cu/Au deposition and patterning



516 Second polymer deposition and patterning



517 Third Cu/Au deposition and patterning

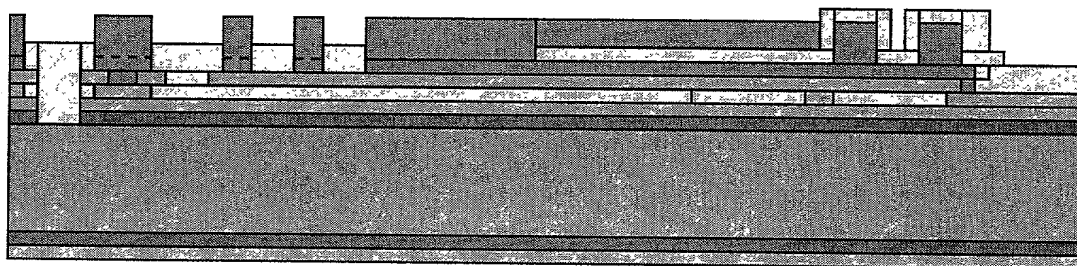
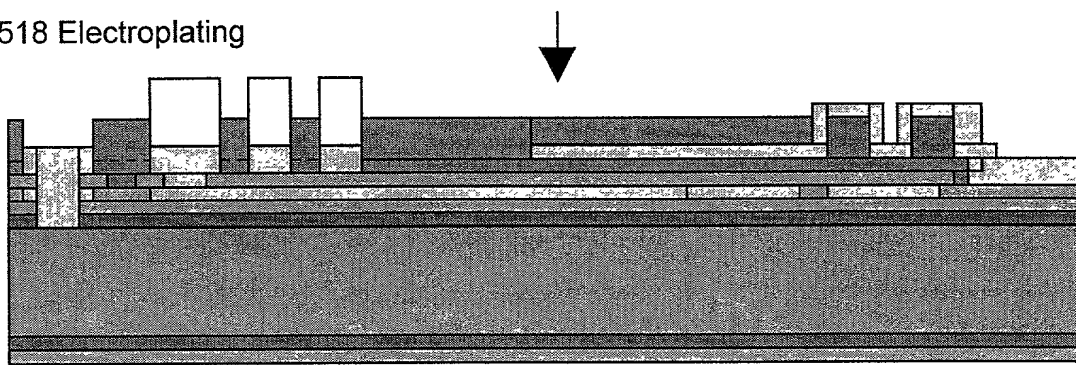
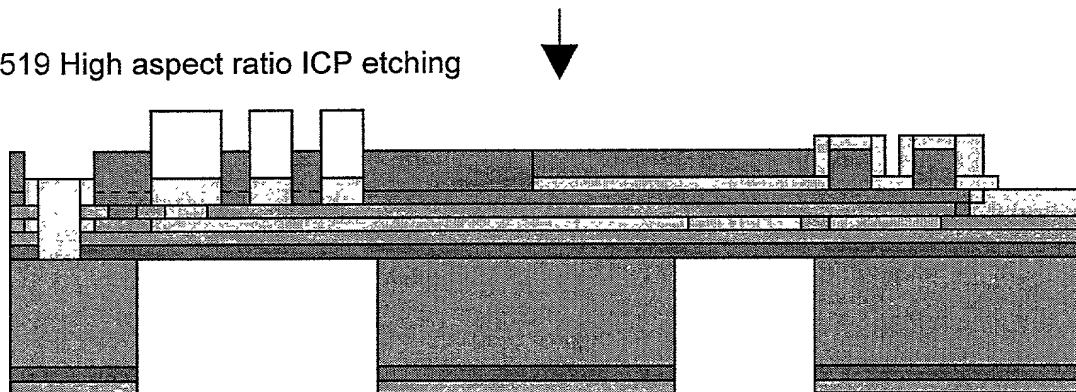


FIG. 5c

518 Electroplating



519 High aspect ratio ICP etching



520 Sacrificial polymer removal

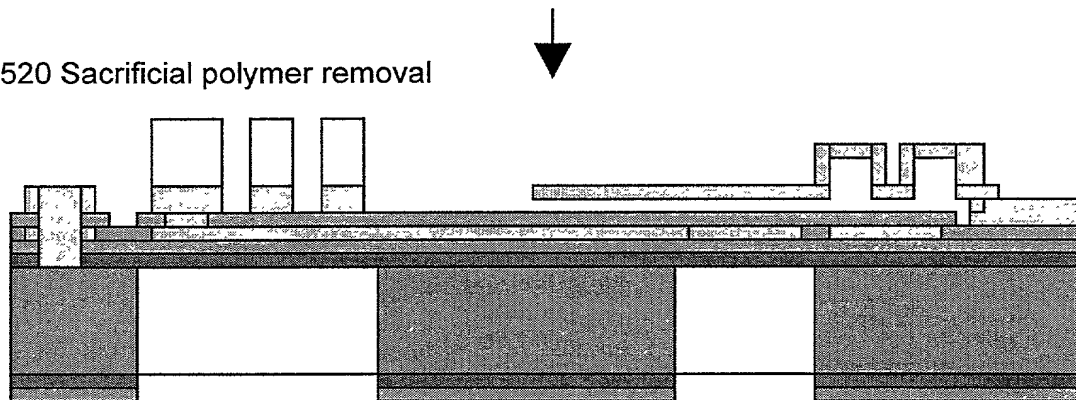
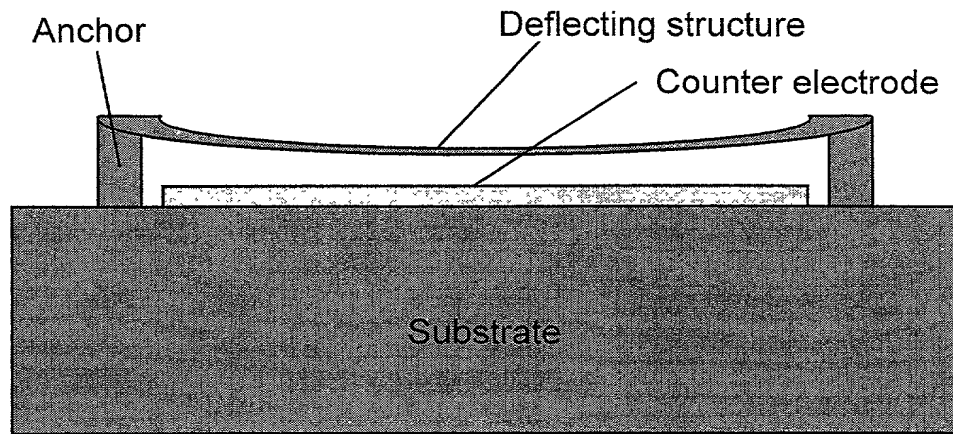
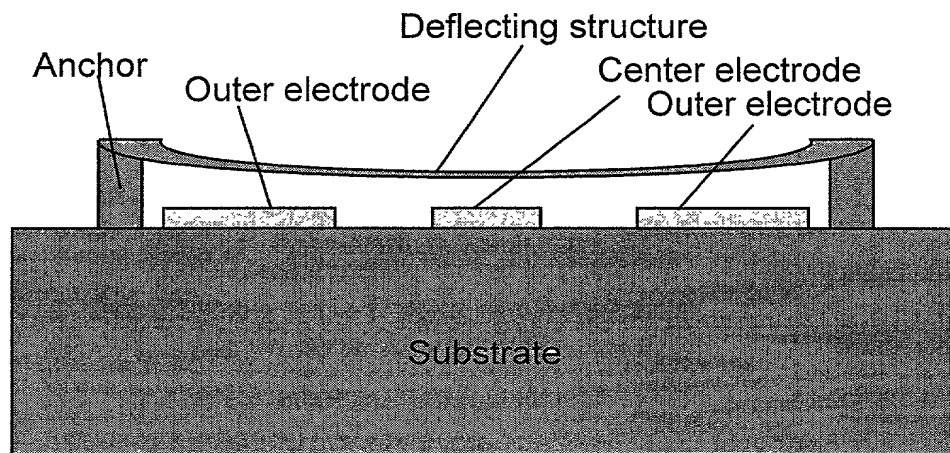


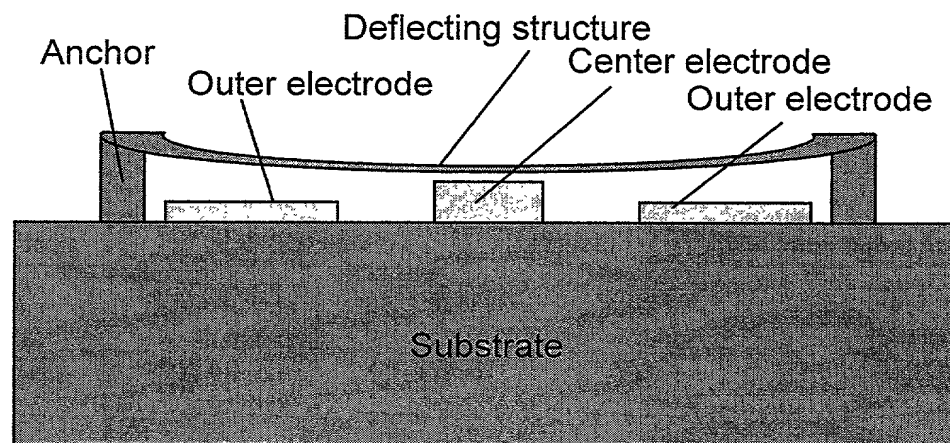
FIG. 5d



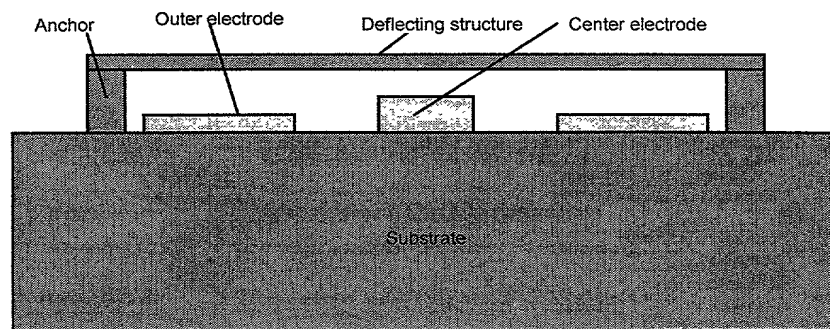
**Fig. 6a**  
PRIOR ART



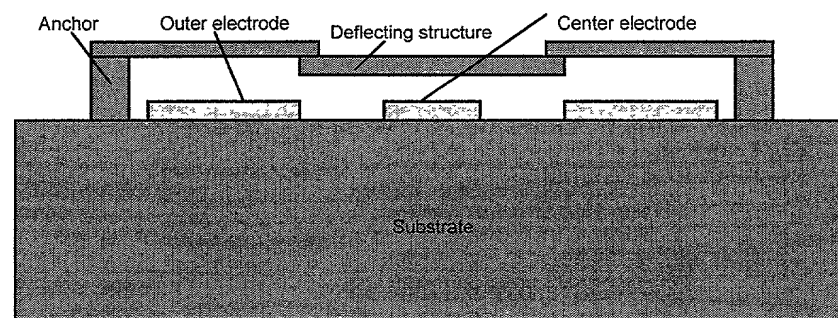
**Fig. 6b**



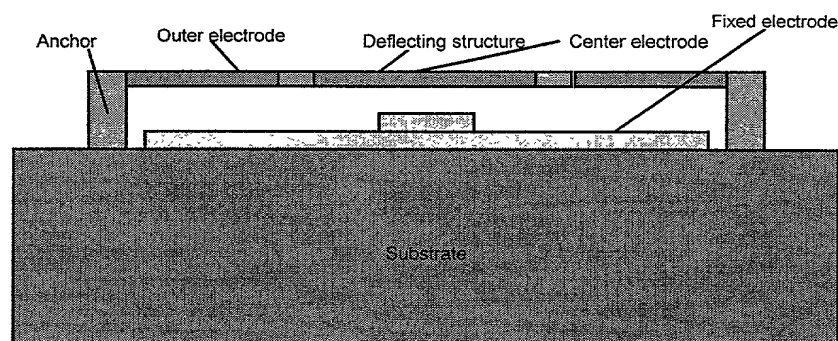
**Fig. 6c**



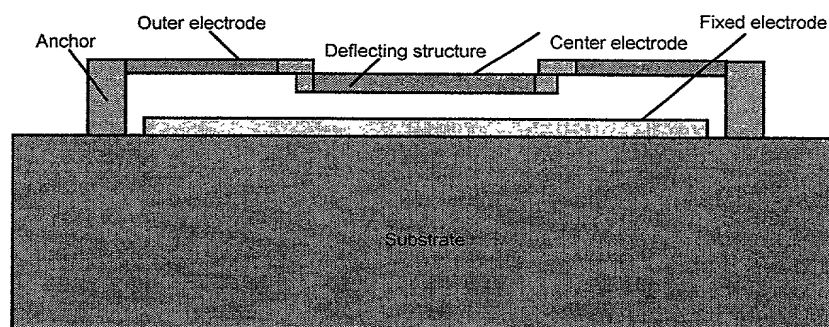
**Fig. 7a**



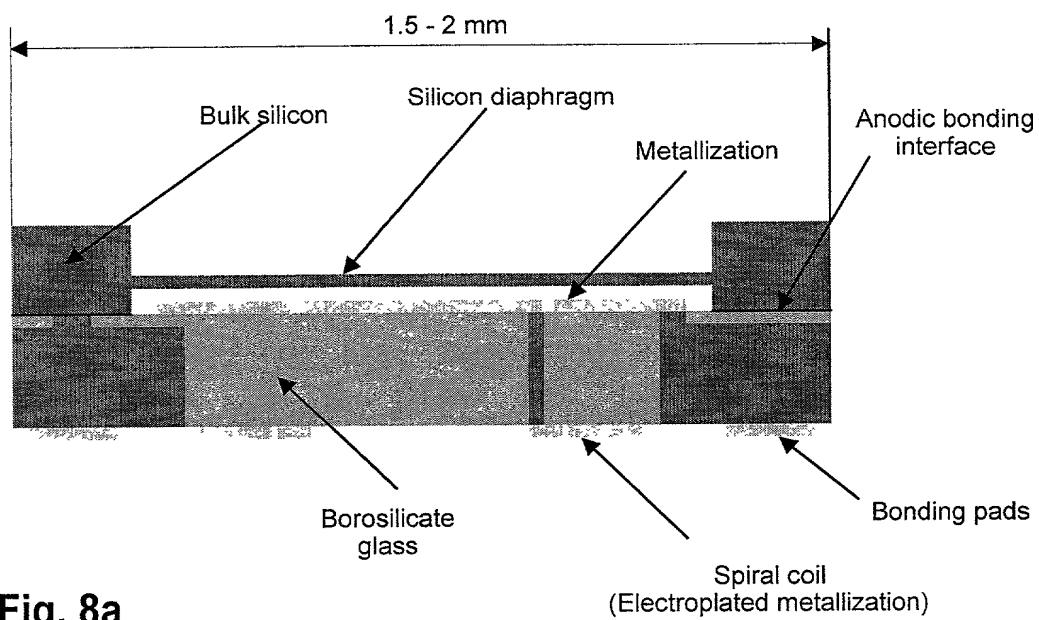
**Fig. 7b**



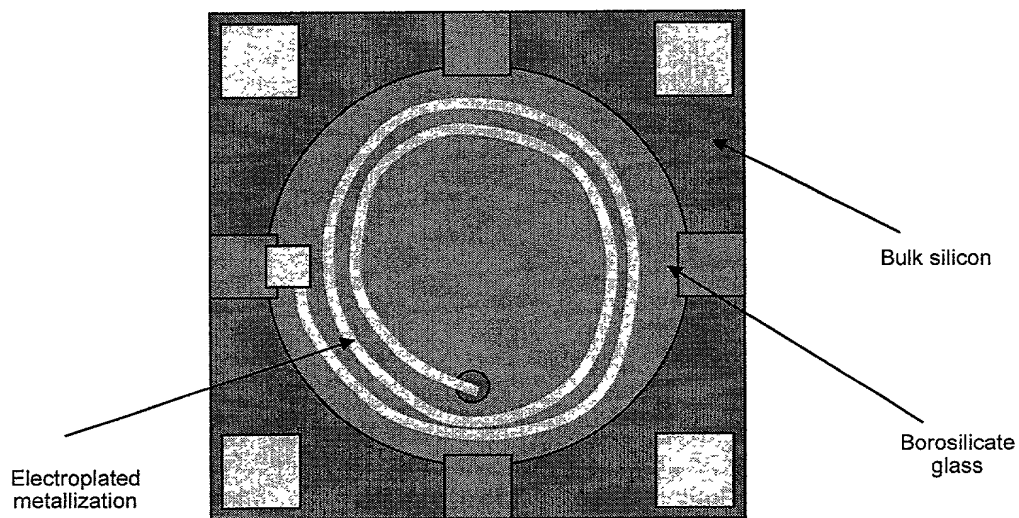
**Fig. 7c**



**Fig. 7d**



**Fig. 8a**



**Fig. 8b**

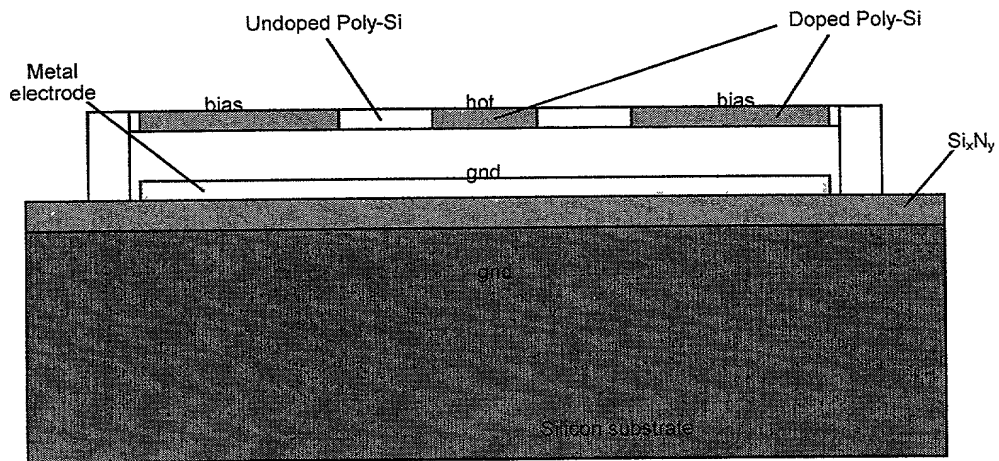


Fig. 9

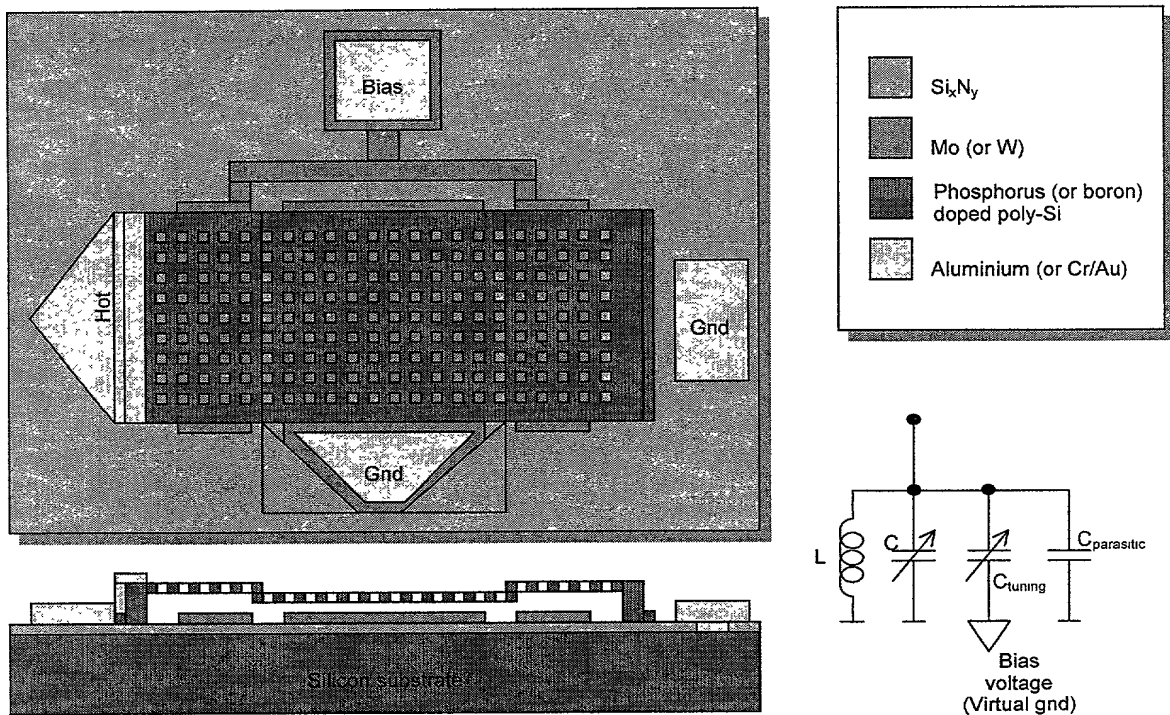


Fig. 10c



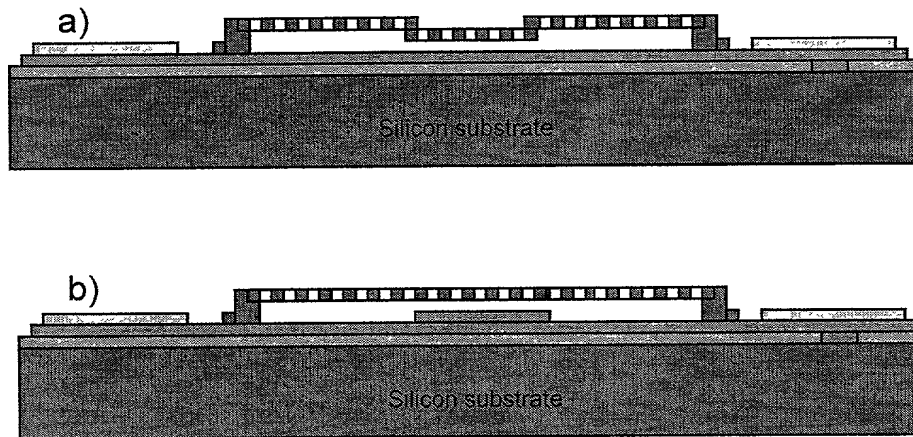
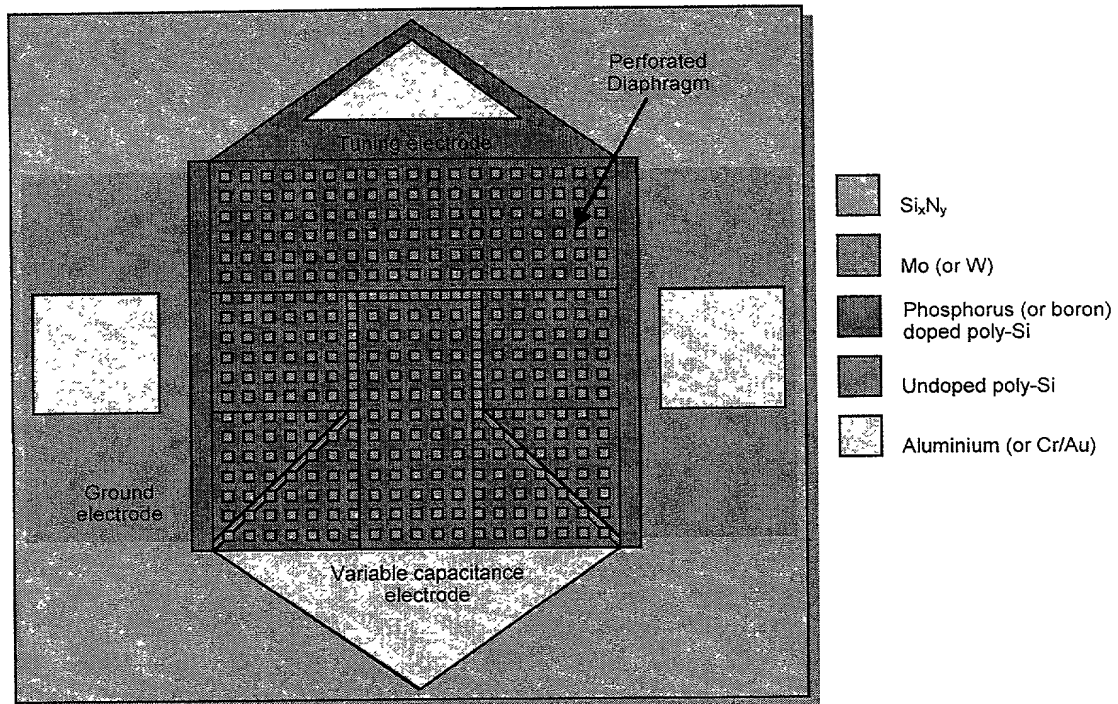
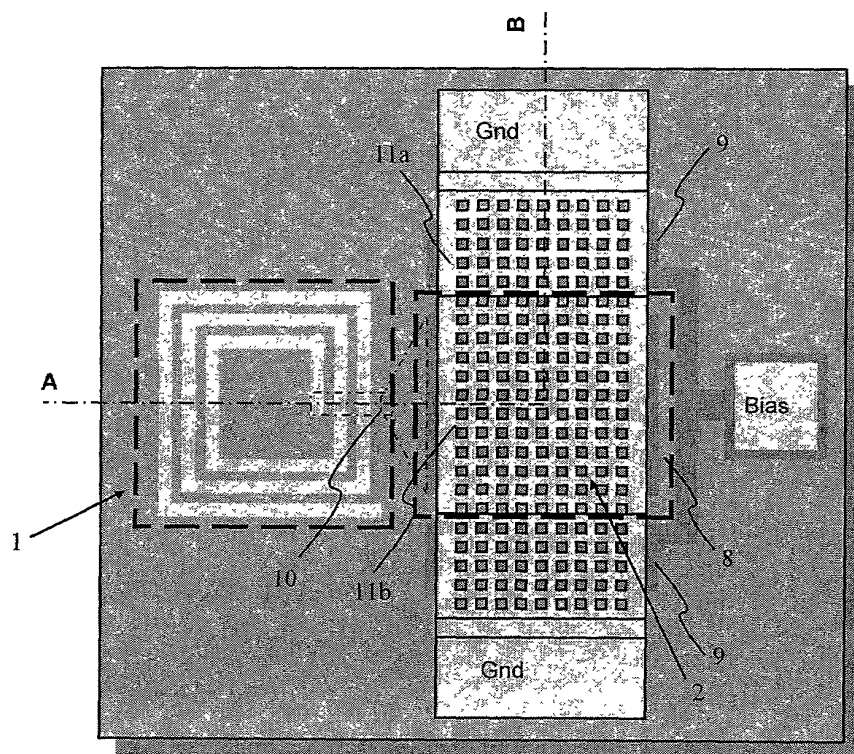
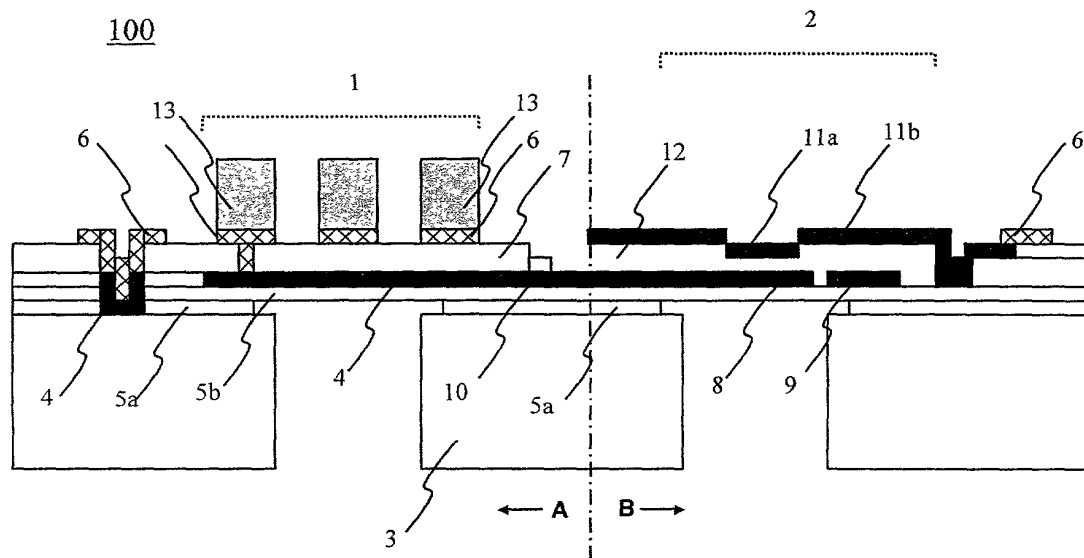
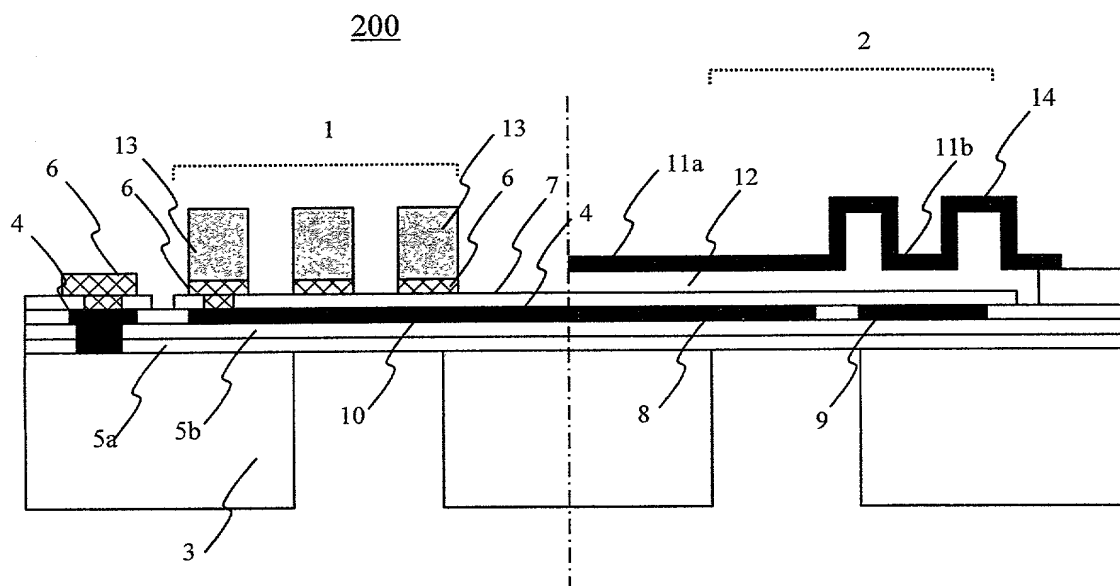


Fig. 10a,b





**FIG. 12**